Chapter 3

The Molecules of Cells

Chapter Objectives

Opening Essay

Explain why lactose intolerance is considered normal in adult humans.

Introduction to Organic Compounds

3.1 Explain why carbon is unparalleled in its ability to form large, diverse   
molecules.

3.1 Define organic compounds, hydrocarbons, a carbon skeleton, and an isomer.

3.2 Describe the properties of and distinguish between the six chemical groups   
important in the chemistry of life.

3.3 List the four main classes of macromolecules important to life. Explain the   
relationship between monomers and polymers. Compare the processes of   
dehydration synthesis and hydrolysis.

Carbohydrates

3.4–3.7 Describe the structures, functions, properties, and types of carbohydrate   
molecules common in the human diet.

3.6 Explain how and why high-fructose corn syrup is produced.

Lipids

3.8–3.10 Describe the structures, functions, properties, and types of lipid molecules.

3.10 Describe the health risks associated with the use of anabolic steroids.

Proteins

3.11–3.13 Describe the structures, functions, properties, and types of proteins.

3.12 Explain how a protein’s shape determines its functions.

Nucleic Acids

3.14–3.15 Compare the structures and functions of DNA and RNA, noting similarities   
and differences.

3.16 Describe the adaptive advantage of lactose tolerance in people of East African decent.